National Institute of Environmental Health Sciences

Quantification of the heat wave effect on cause-specific mortality in Essen, Germany

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Abstract:

The impact of high temperatures on mortality is well known, but not all deaths that occur during heat waves can be explained by this effect. We evaluated whether an additional mechanism caused by periods of sustained heat without nightly cooling influenced mortality during the European heat wave in 2003 and whether this mechanism is different for varying causes of death. We obtained daily counts of total and cause-specific mortality for Essen, Germany, for the years 2000-2006. We used time-series regression methods to separate a possible additional effect of sustained heat from the temperature effect and included air pollution, influenza epidemics, long-term and seasonal trends, days of week and bank holidays as covariates. The maximum daily relative risk of all-cause mortality during the heat wave was 1.28 (95% CI 1.06-1.53). The maximum relative risks of cardiovascular and neoplastic mortality were 1.25 (95% CI 0.95-1.65) and 1.35 (95% CI 1.00-1.82), respectively. The effect on respiratory mortality was delayed; the maximum relative risk was 1.66 (95% CI 1.19-2.23) 6 days after the heat wave. We found that periods with sustained heat especially affected respiratory mortality, whereas for cardiovascular and neoplastic mortality no distinct influence could be shown.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Germany

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Injury, Respiratory Effect

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content